Drylands Learning and Capacity Building Initiative for Improved Policy and Practice in the Horn of Africa

TECHNICAL BRIEF: Progress to date with measuring resilience in the Horn of Africa[1]

Catherine Fitzgibbon, independent consultant, March 2014

Summary

In the last few years 'building resilience' has emerged as a key goal for governments and other development and humanitarian stakeholders in the Horn of Africa (HoA). Programmes and funding strategies are increasingly realigning themselves around resilience-building objectives. All IGAD[2] member states have developed Country Programme Plans (CPP) as part of the IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) for 2013-2017. These are being backed up with significant financial resources from a wide range of donors (possibly as much as US$ 1.3 billion[3]). Despite this thrust there are still significant challenges in translating resilience into practical programming and to measuring it on the ground. Being able to measure resilience is particularly essential to understand how and when resilience has, or has not, been built as a result of specific policies or programming. It is also necessary to measure progress in achieving resilience, either over time or between target groups or populations, to inform improved policy and practice and to prioritise one intervention over another.

Several models have been developed to clarify the concept of resilience[4], but to date few practical monitoring frameworks or tools have been developed to measure it. There are many reasons for this including: the problem of defining exactly what to measure in such a multifaceted concept; the complexities of data collection; and whether measurement needs to be contextual or universal. This brief identifies the key challenge of measuring resilience as being to identify of a combination of multi-sectoral variables, both universal and contextual, which provide an optimum definition of resilience once achieved. These must be capable of being measured via a manageable set of indicators for which data is (or can be) feasibly collected. Three agencies that have attempted to do this are highlighted here and examined briefly in terms of how they have tackled the many challenges.

The challenges of measuring resilience

The first hurdle in measuring resilience is **obtaining consensus on its definition**. Multiple definitions exist and each organization tends to understand and interpret resilience differently, sometimes to fit their own purposes. The majority of definitions broadly reinforce each other (see examples below), but a problem with all of them is that they are very general. Some definitions tend to describe resilience as a process rather than as an end state; some focus on resilience to a disaster or crisis alone; and others include reference to longer-term change and development pathways. With such wide-ranging definitions nearly any intervention can now be re-labelled as 'resilience-building'. And when the term is so all encompassing, it is not easy to determine what to measure.

Most definitions also fail to describe what resilience looks like in reality when it has been attained, so that even when individuals or organisations agree on a standard definition they each envisage or describe a 'resilient'

[1] Thanks go to Marko D'Errico, FAO, Eugenie Reidy, UNICEF and John Kurtz, Mercy Corps for their input into this brief.

[2] The Intergovernmental Authority on Development (IGAD) is an eight-country trading bloc based in Eastern Africa.

[3] Downie, K. (November, 2013). Technical Consortium: Our Approach to Resilience. Presentation made at Food Security and Nutrition Working Group Meeting, Nairobi, Kenya. http://www.disasterriskreduction.net/fileadmin/user_upload/drought/docs/Katie%20Downie%20-%20Technical%20Consortium%20presentation%20to%20FSNWG%20211113.pdf.

household, community or country differently. This shapes views about how resilience can be achieved, which interventions should be prioritised, and is a further challenge to measurement metrics.

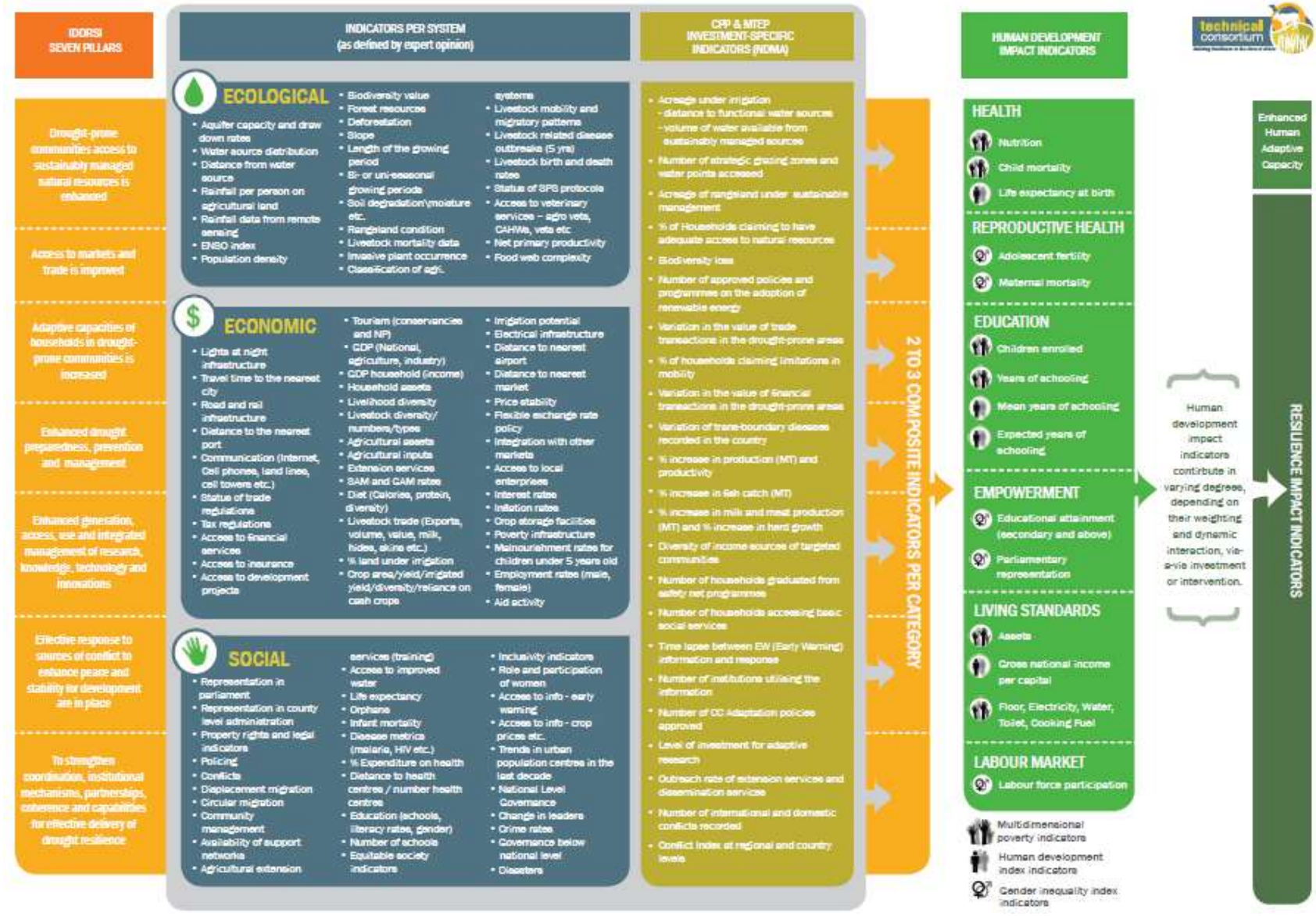
Definitions of Resilience
Disaster focused
"The ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner." **(UNISDR 2009)** "Building resilience is a transformative process of strengthening the capacity of women and men, communities, institutions and countries to anticipate, prevent, recover, adapt and/ or transform from shocks, stresses, and change." **(UNDP Resilience Position Paper 2013)**
Disaster + development
"Resilience is defined here as the capacity to ensure adverse stressors and shocks do not have long-lasting adverse development consequences." **(IGAD Resilience Technical Working Group 2013)** The ability of countries, communities, and households to efficiently anticipate, adapt to and/or recover from the effects of potentially hazardous occurrences (natural disasters, economic instability, conflict) in a manner that protects livelihoods, accelerates and sustains recovery, and supports economic growth. **(TANGO 2012)** "Disaster Resilience is the ability of countries, communities and households to manage **change**, by maintaining or transforming living standards in the face of **shocks or stresses** - such as earthquakes, drought or violent conflict – without compromising their long-term prospects." **(DFID Approach Paper 2011)**
Resilience as a Process
The capacity of households to manage shocks and stresses in a manner that avoids adverse, long-term consequences to their food security and well-being **(Mercy Corps 2012)**

Monitoring frameworks for measuring resilience can assist in articulating what resilience building means in practice. By establishing indicators to measure resilience, a framework effectively defines and describes what resilience could or should look like as an outcome or objective - i.e. the end state. Unfortunately it is frequently in the development of frameworks that differences in opinion about what resilience really comprises start to emerge.

One of the key reasons why so many agencies struggle to measure resilience is the fact that resilience is an inherently multi-faceted and holistic concept. As a result, when organisations attempt to consider what facets or components of resilience need to be measured, they are paralysed by choice. Trying to identify issues or factors that are NOT part of resilience is in fact much harder than developing list of factors that ARE part of resilience building. Each agency will have a natural bias around their area of interest: Humanitarian agencies may focus on food security and disaster risk reduction issues; environmental scientists may focus on natural resources and environmental sustainability; politicians will often see economic development and livelihoods as central. All these factors as important aspects of resilience, and when multiple stakeholders come together to discuss resilience the list of possible variables can increase exponentially.

A Resilience Monitoring Framework is emerging to track IGAD's CPPs to End Drought Emergency (see below). The framework contains over 100 potential variables or indicators that should / could be monitored to track country progress in resilience building. The problem with this all-inclusive approach is that it is neither practical nor feasible to collect or analyse such enormous amounts of data. Even if member states were to be able to collect the level of data suggested by the IGAD framework, it is not clear how this information would be useful: progress over time and comparisons between locations would not be possible with so many variables and indicators in play. The result is likely to be lots of data but very little improved understanding of resilience, and no guidance as to which policies or interventions are working best to build resilience.

The emerging IGAD Resilience Monitoring Framework



A technical consortium of experts is currently working with IGAD to develop a more systematic approach using existing data sets. To date it has interrogated existing data sets in the HoA and identified 165 indicators for which spatially appropriate data exists. This process is useful in itself for highlighting the sectors or factors for which data is poor and where attainment levels are particularly low. The information can be used to identify sectoral areas that show less resilience than others, or those where it is simply not known. The next stage will be to use this information to inform national resilience monitoring frameworks, and to develop decision analysis tools that can be used by authorities to prioritise resilience-building investments.

Practical data collection issues

The practical difficulties involved in collecting the level and types of data suggested by emerging resilience frameworks cannot be understated. Data collection has always been problematic in the arid and semi-arid lowlands of the HoA, which are arguably the least resilient areas. Collecting data from remote, mobile populations who have multiple and dynamic livelihood strategies is fraught with difficulty. Even basic human and livestock census and livelihood data does not exist.[5] Low population densities mean national data sets often use data from these areas based on very small unrepresentative sample sizes: A single small data set may exist to measure a variable for the entire ASAL area, e.g. maternal health figures for the ASALs in Kenya are based on a sample of 97 households[6]. It is therefore also impossible to compare progress in different ASAL districts in Kenya using national data sets.

Another constraint is that certain issues that may be critical to resilience are extremely difficult to measure. Examples include: peace/security, governance and women's empowerment. These are factors that influence decision-making and risk-taking, that impact upon resilience, but which may be psychological or cultural in nature. As such they are rarely subject to systematic, on-going data collection enabling inter-country comparison. Also, there is usually no one widely accepted indicator, but a whole set of proxy indicators that would need to be collected for just one issue. Another data collection problem in 'disaster' affected areas is that variables can move both up and down very quickly as a result of shocks and hazards, such as drought. As a result data is often highly skewed by making long-term trends hard to establish. Longitudinal panel data is thus required, but its collection can be resource heavy and difficult - especially where households are mobile.

The costs of regular, high quality data collection is a critical factor, and rarely considered by those developing 'ideal' monitoring frameworks. There is a correlation between the number of indicators and the data required, and the likelihood that such data will be collected well on a regular basis and analysed appropriately: It is better to have good reliable data on a few indicators than patchy poor quality data on many indicators. The crux of the problem however is to identify the optimal minimum number of indicators but which together fully reflect the holistic nature of resilience.

A further issue that emerges from debates on indicators for resilience measurement is the extent to which resilience is a universal or a locally contextual concept. A resilient household in one area might look very different to one in a different context or environment, and therefore the same set of indicators cannot be used to measure resilience everywhere. For example in Karamoja, Uganda, a household is considered resilient if it has over 10 cattle; whereas in Marsabit, Kenya a resilient household is deemed to require over 200 shoats and 50 camels or cattle to be resilient[7]. The difference is because the factors that make a household resilient will depend on the nature and scale of the shocks/hazards faced, and the livelihood strategies employed. The resilience indicators cannot therefore be the same in each location. The counter argument is that without some universal measure(s) of resilience it is impossible to compare progress between and across populations.

[5] Counting pastoralists, Jeremy Swift and Saverio Kratli, DLCI/REGLAP, March 2014 (forthcoming)
[6] Demographic Health Survey (DHS) Kenya 2009 – this was due to only one administrative district (North-Eastern) being exclusively arid / semi-arid and pastoral.
[7] CoBRA Assessment Findings, UNDP DDC (forthcoming)

If a regional goal of achieving resilience is to be useful it should perhaps catalyze action to achieve tangible results similar to those that inspired the Millennium Development Goals (MDGs). Each MDG represented a single impact indicator (e.g. MDG4 the reduction of child mortality), that is an ideal end state, and which can be used to compare countries and thereby motivate action. For example, although the factors underlying child mortality are contextually specific in each country, and different interventions and strategies will be required to tackle them, a causal analysis used to develop the right interventions will then lead to the same end result. This process will also almost certainly require the development and monitoring of locally specific process indicators, which would not need to be measured in all locations. For instance you would not measure the incidence of malaria in a non-malarial area. The identification of universal and contextually specific indicators for resilience could be done in the same way.

Three practical efforts to measure resilience

Boxes 1-3 below provide brief summaries of three practical efforts to measure resilience: UNDP's Community Based Resilience Analysis (CoBRA), FAO-WFP-UNICEF's Mixed Methods model and Mercy Corps/TANGO's Resilience Determinants Analysis (RDA) approach. Each had been trialled in practice over the last year or more in the HoA. There are some interesting similarities and differences in terms of how each approach has tackled some of the key problems in measuring resilience.

Case Study 1: UNDP - Community Based Resilience Analysis (CoBRA) Assessment

How does this approach define or conceptualise Resilience?

Resilience is ultimately defined by the communities being assessed, however, the conceptual framework of CoBRA is based on the premise that resilience can be measured in two ways: 1) **With an overall or universal measure or indicator(s) of resilience** i.e. households that are able to meet basic needs on a consistent basis both in shock/stress and 'normal' times without external relief; and 2) **With composite and contextually specific indicators of resilience** that enable us to understand how local drivers of resilience are expanding or contracting.

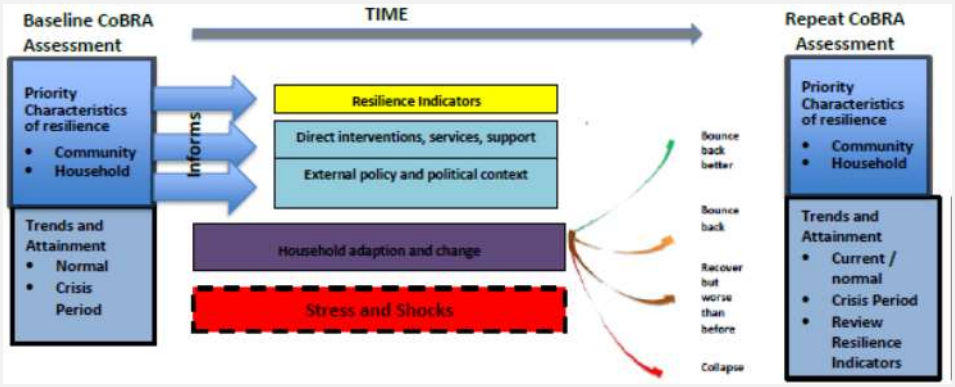


Figure1: COBRA Conceptual Framework Model

Whose resilience has been assessed so far using this approach?

Four full CoBRA assessments have been undertaken to date in Marsabit, Turkana and Kajiado in Kenya and Karamoja in Uganda. The approach assesses community and household resilience characteristics. To date this has been at the district / county levels, however it could also be used for smaller community groupings. It is not suitable as a national assessment.

What is the methodology?

The CoBRA methodology uses qualitative participatory approaches, i.e., focus group discussions (FGDs) and key informant interviews (KIIs), to collect primary data. In each field site, between 36-42 FGDs and KIIs are carried out, following the steps outlined below:

- **FGD Step 1. Agree the definition of resilience**
- **FGD Step 2. Identify resilience characteristics**: What are the characteristics of a resilient community?
- **FGD Step 3. Prioritise resilience characteristics**: The community ranks the three most important characteristics of resilience.
- **FGD Step 4. Rate the community's progress to attain the priority resilience statements**: How far has this community achieved each of these characteristics in current periods, and in crisis periods (on a scale of 0-10)?
- **FGD Step 5. Identify interventions that have contributed to household resilience**
- **FGD Step 6. Identify the types of households in the community that have achieved the resilience statements.**
- **KII with nominated resilient households**: Which factors or characteristics have contributed to their households' resilient

status? Why did they cope better with shocks and crisis affecting that community? What interventions would best build wider resilience?

How are the variables / components of resilience to be measured selected?

A baseline CoBRA assessment uses the resilience characteristics prioritised by communities to identify a shortlist of resilience quantitative (and possibly qualitative) indicators. These universal and locally specific indicators can then be systematically measured on a regular basis to monitor resilience over time and in relation to different interventions.

What do the assessments findings tell you?

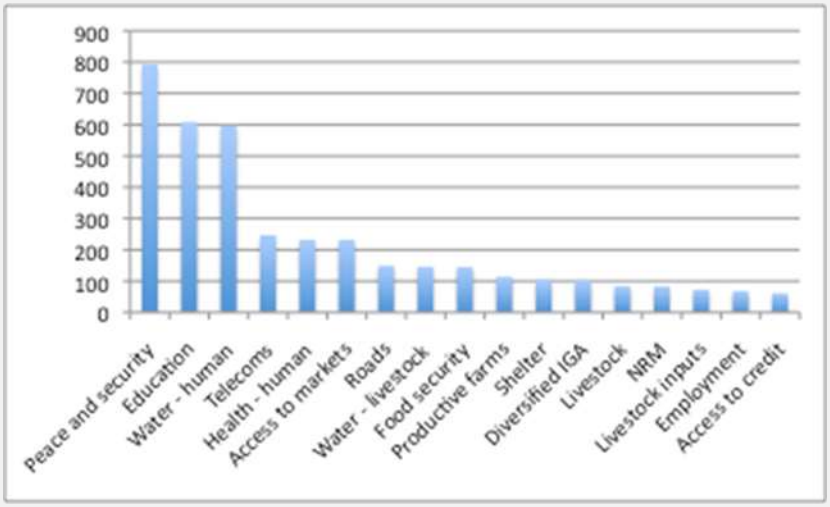
(1) The priority characteristics of **community resilience** for that target population; (see example table for Marsabit below)

(2) The communities' perception of their achievement of these characteristics during 'normal' and the last crisis / disaster period;

(3) The characteristics and strategies of existing **resilient households**; and

(4) The most highly rated interventions or services in building local resilience.

Figure 2: Priority Community Characteristics of Resilience – Marsabit, Kenya



Can findings be compared (over time and across locations)?

Priority community and household resilience characteristics and interventions can be compared, but levels of attainment cannot be compared between locations. The robustness of comparisons over time is still to be assessed. Clearly if resilience characteristics are mapped to more standard indicators for which regular data is collected attainment can be better compared between communities and over time.

How can this approach help make decisions about resilient-building interventions?

The baseline assessment identifies the interventions communities believe are most effective at building resilience. This is useful information in itself. On-going monitoring of the shortlisted resilience indicators in the area should then be used to verify or correlate the relationship between the interventions highlighted by the communities and the impact upon resilience.

Who could use this assessment approach?

Multi-stakeholder groups in a particularly community, ideally led by government authorities. The assessment should assist multiple agencies to:

- Inform their strategies, policies and programme planning by focusing on the priority characteristics of resilience for a target population;
- Develop a locally validated short-list of resilience indicators for stakeholders to feed into wider resilience monitor and impact initiatives;
- Involve communities in the resilience debate, planning and evaluation processes;
- Undertake periodic monitoring of communities to assess perceived changes in priority resilience characteristics, interventions and attainment.

Case Study 2: FAO/WFP/UNICEF – Mixed Methods Approach to Resilience Measurement

How does this approach define or conceptualise Resilience?

The Mixed Methods approach was adapted from the FAO's econometric model to assess resilience in Dolow Somalia for the FAO-UNICEF-WFP three-year resilience strategy for Somalia. The three agencies share a common results framework developed for the context of Somalia incorporating three ultimate resilience outcomes: 1) household income/production; 2) access to basic services and 3) social safety nets. The figure below from the conceptual framework shows how the three outcomes are constructed from the eight pillars that are used to calculate a composite resilience index.

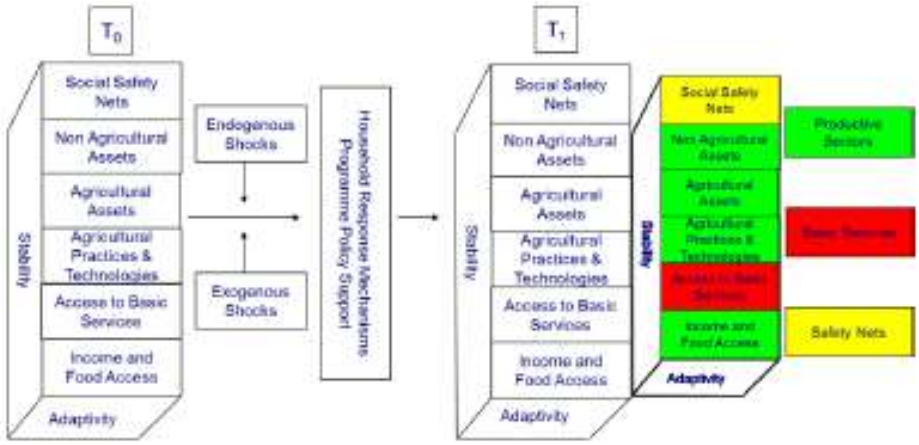


Figure 1 FAO/WFP/UNICEF's Mixed Methods approach

Whose resilience has been assessed so far using this approach?

The Mixed Methods Approach has been piloted in Dolow district of South Central Somalia. The full assessment results are to be released soon and will be available on www.resilienceinsomalia.org The assessment will be extended to a three further districts within the FAO-UNICEF-WFP Resilience Strategy program area in Somalia.

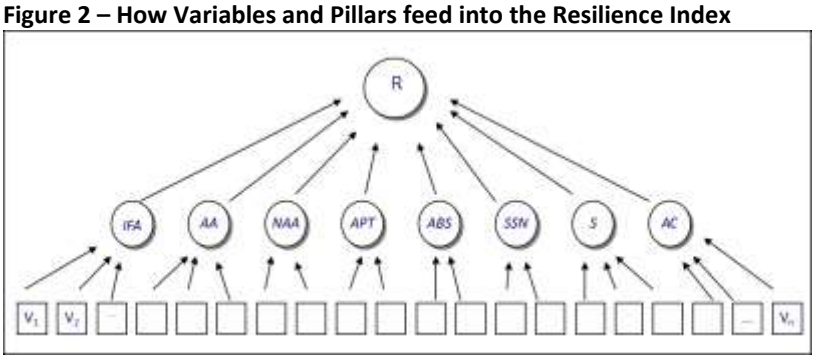
What is the methodology?

As the name implies, the Mixed Methods Approach combines qualitative and quantitative methods to inform and complement each other, allowing an understanding of the complexity and dynamism of resilience. The FAO econometric model was embedded in qualitative data collection methods. The first step involves community consultation, focus group discussion and use of other participatory tools to define what resilience means locally - to inform the programme design and household survey. The second step was a baseline household survey (of over 1,000 households) to measure assets, capacities, sensitivity to shock and other indicators contributing to resilience to generate a baseline resilience index. The third step entails further qualitative investigation in the form of consultations, FGDs and key informant interviews. The purpose is to validate and deepen understanding of the household survey and inform the next quantitative survey. The second household survey forms the impact evaluation and generates the 2nd resilience index. This shows how the resilience of households and livelihoods has changed and the impact of interventions as well as refining the research method.

How are the variables / components of resilience to be measured selected?

The purpose of the methodology is to identify the significant variables that feed into the pillars shown in figure 1 to use to estimate the resilience index. See figure 2 below. An initial long list of resilience variables for the Somalia assessment were identified by the three agencies during the programme design. The initial consultation phase further informed this list in line with communities' perceptions of resilience. The household questionnaires for the Mixed Methods study were designed to elicit comprehensive data for the construction the resilience index. This is derived using Structural Equation Models.

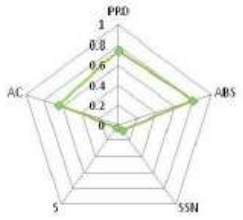
Figure 2 – How Variables and Pillars feed into the Resilience Index



What do the assessments findings tell you?

The variables and dimensions that contribute most to determining the resilience index in the Dolow districts and how the resilience of different livelihood groups (or other aggregations) is defined. Some of the most important factors that emerged include assets, markets and access to basic services; but also several less observable capacities, aspirations and connections. For example social support networks, the changing economic roles of women and youth, preparedness, and mobility.

Figure 1: Factor loadings of dimensions and variable for Pastoralist



PASTORALIST – factor loading of dimensions

PASTORALIST – factor loading of variables for individual dimension (e.g. Access to Basic Services)

Can findings be compared (over time and across locations)?

Yes, so long as the data sets contain information of similar depth and content over time and across target locations. The absence of panel data reduces the possibility of foreseeing future values of household resilience; but this will be addressed once the second round of the survey will be collected. With the expanded understanding, as panel data is collected over time, 'thresholds' for levels of resilience will be set, against which programming can be held to account.

How can this approach help make decisions about resilient-building interventions?

Knowing which variables and dimensions contribute most to determining the resilience index can inform policy and investment decisions. However being a latent model and not a regression model, the Mixed Methods model cannot provide stakeholders with a clear and precise return of investment until a panel data set is generated; for instance the study can suggest where the investment is needed but cannot say the effective return of the marginal dollar invested.

Who could use this assessment approach?

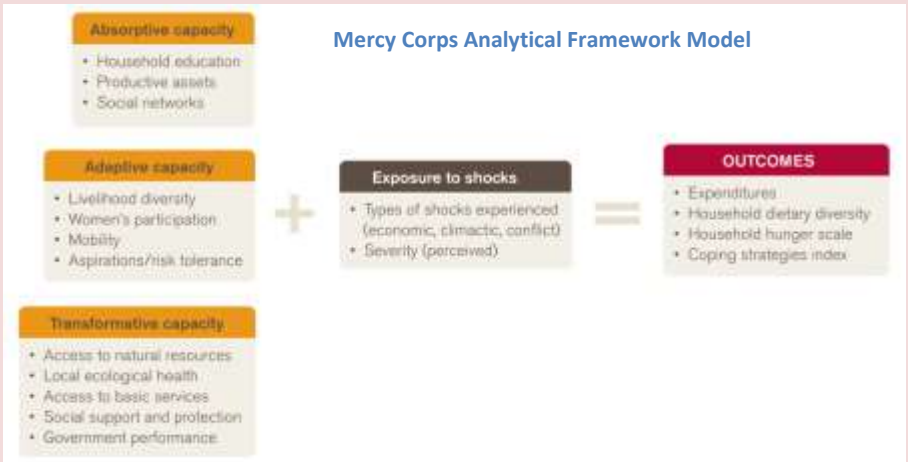
The Mixed Methods Model can be used by decision makers to:

- Provide them with clear indications of where and how to intervene
- Identify populations most in need and groups within populations – e.g. different livelihood groups, female-headed households
- Frame policy, investment and response in terms of resilience
- Monitor and evaluate the impact of interventions

Case Study 3: Mercy Corps-TANGO - Resilience Determinants Analysis (RDA)

How does this approach define or conceptualise Resilience?

This approach applies the definition of resilience set out by the Resilience Measurement Technical Working Group: *The capacity to ensure that adverse stressors and shocks do not have long-lasting adverse development consequences*.



Whose resilience has been assessed so far using this approach?

So far this approach has been tested in five regions in southern Somalia: Bay, Bakool, Gedo, Hiran and Lower Juba. These cover multiple livelihood zones. Mercy Corps has plans to undertake similar studies in Zimbabwe and Myanmar.

What is the Approach and Methodology?

The aim of this form of analysis is to empirically test assumptions regarding what capacities and characteristics are most strongly linked to household's or communities' resilience to a given set of shocks or stressors. The approach is most effective for applying in cases where there is a major covariate shock(s). This enables an analysis of how certain capacities mitigate the effects of the shock(s) on peoples' well being.

Resilience Determinants Analysis is a sequential, mixed methods approach. The first step is to use qualitative data – including secondary sources and community consultations – to generate hypotheses regarding the capacities presumed to be most important to resilience in a given context. These hypotheses are operationalized into a household survey instrument, which is then administered to a representative sample of the shock-affected population. The data from the survey is analysed using

multiple regression techniques to test the hypotheses set out. This results in estimates of the relative contributions of the difference capacities to key well-being outcome for households with similar characteristics, and levels of exposure to the shock(s). Lastly, the quantitative findings are validated and interpreted through qualitative methods, including expert opinion and where possible, community feedback sessions.

How are the variables / components of resilience to be measured selected?

Data was collected on the variables shown in the analytical framework (shown). These were selected from a much longer list through consultation and discussion with both expert and key informants from local communities. Variables are grouped into the following categories;

- **Disturbance measures**: This should include the types, durations, intensity and frequencies of shocks or stresses experienced.
- **Capacities:** These can be categorized around absorptive, adaptive, and transformative capacities. What indicators go into each of these (or other) categories will depend on what factors are expected to contribute to resilience in a given context.
- **Well-being outcomes:** Where possible, these should be measured both before and after a disturbance / shock. Standard food security and nutrition measures have been used in the past, but these could be substituted with health, psychosocial or other outcomes of interest.

What do the findings tell you?

The results identify key leverage points for enhancing and tracking change to key resilience capacities over time. The findings are specific to the type(s) of shocks analysed, and the population studied. In the Somalia study, several of the findings confirmed the hypotheses tested. For instance, extended social networks and pastoral livelihoods made demonstrable contributions to greater resilience. Other factors that were assumed to make a difference, turned out not to be important to resilience, including the number of livelihood sources, and access to health services and basic education.

Can findings be compared over time and across locations?

This approach identifies critical resilience capacities at the household level. Similar techniques could be applied at the community level or for larger administrative units, such as Districts.

If similar data collection tools and analysis techniques are used, the results of a resilience determinants analysis can be compared across locations. Follow-up studies could yield valuable insights into the recovery period, for instance on what sets of capacities make the largest contributions to enabling households and communities to rebuild assets and their livelihoods after a major shock or disturbance.

How can this approach help make decisions about resilient-building interventions?

The results of this approach can guide program and investment decisions towards interventions focused on what is demonstrated to matter most for resilience for a given population. The factors and capacities identified as most important can also be used as the basis for monitoring and evaluation. By tracking changes to the 'validated' resilience capacities over time, decision makers can have more confidence in making determinations of whether a program or policy is having the intended effects.

Who should undertake this assessment?

Resilience determinants analysis can be used by larger NGOs and national government agencies. Support from staff or consultants versed in quantitative analysis methods will be needed.

The similarities and differences between the three models

1. Defining resilience

Both the Mixed Methods and Resilience Determinants Analysis (RDA) models identified 'outcome indicators' of resilience before undertaking each study. In the RDA model resilience outcomes were primarily food security related. The Mixed Methods model set three ultimate resilience outcomes: 1) household income/production, 2) access to basic services, and 3) social safety nets. Both identified outcomes linked to the results frameworks of the accompanying programmes/interventions, which themselves reflect the mandates and objectives of the organisations. Both attempt to identify why different households in similar contexts can have different resilience outcomes. The RDA model focuses more as a post-shock result whilst the Mixed Methods model could be applied in crisis and non-crisis periods. The CoBRA model does not begin with a pre-determined definition of resilience, but as

part of the data collection process asks communities to define the characteristics of both 'resilient' communities and households.

2. Data collection

The models include a variety of data collections approaches. The CoBRA model collects primary data using only qualitative means i.e. focus groups discussions (FGDs) and key informant interviews (KIIs). The information can they be taken forward by users to interrogate or modify existing quantitative data collection processes. Primary data collection and analysis can be undertaken relatively quickly i.e. within a month. The Mixed Methods model is an adaptation of the highly quantitative FAO econometric model[8] based on household surveys combined with rounds of qualitative assessments in the form of individual and community consultations. The RDA model takes a similar approach also using qualitative data to inform quantitative household surveys. These quantitative approaches tend to be more time consuming and costly to undertake in terms of both data collection and analysis.

3. Target groups or populations

To date all the models have attempted to measure resilience for communities either at administrative or livelihood levels - although some could also be used to measure resilience at different levels. The Mixed Methods and RDA approaches focus on the analysis of household level data sets, therefore, so long as the necessary household data sets exist, these can be analysed at any level e.g. community, national or regional. The FAO econometric model, which underpins the quantitative analysis of the Mixed Methods approach, has been used to interrogate national level resilience using national household data sets such as household budget surveys[9].

The CoBRA model is not based on a scientific sample but merely identifies typical population groups from the target community - i.e. comprising men, women and youth further disaggregated into livelihood zone and exposure to interventions. CoBRA collects community and household level data that is considered for a typical district/livelihood zone. CoBRA assessments could be undertaken for communities below district level e.g. sub-location or village, but they are not suitable for higher-level aggregations - national or regional levels - as communities (and their characteristics) become too heterogeneous.

4. Key resilience variables

All the models attempt to identify a short(er) list of variables and indicators to measure resilience. In fact when comparing the end results of each approach their primary objective is to identify the most important or significant variables / dimensions affecting resilience. Each approach does this differently:

The CoBRA model identifies the priority 'characteristics' of resilience based on aggregated bean scores from FGDs and descriptions of 'resilient' households. The results of their assessments to date have identified certain factors as being essential for household resilience in all locations - i.e. household income and asset levels, multiple and independent sources of income, and household levels of education. The range of characteristics or variables that were consistently identified as describing a resilient community were wider, and prioritized differently in different locations. Characteristics that were highly prioritized in all the assessment locations included: education; water; peace and security; human health; productive livestock herds and farms; access to markets and credit; diversified incomes; and roads. In each location a priority combination of these factors is used to identify indicators for on-going systematic monitoring.

The Mixed Methods model identified a long list of potential variables based on previous experience, literature reviews and the initial qualitative assessments done in the Dolow location. These were included as questions in a very comprehensive household questionnaire, the results of which were analysed with the econometric RIMA (Resilience Index Measurement Analysis) model to assess significance. Within each livelihood zone different variables impacted differently on the resilience score; but overall the dimensions found to be of greatest significance

[8] Resilience Impact Monitoring Analysis document (forthcoming)

[9] Livelihoods Strategies and Household Resilience to Food Insecurity: An Empirical Analysis to Kenya; *L.Alinovi, M. D'Errico, E.Mane. and D. Romano (2010)*

to resilience in Dolow were productive assets and access to markets, basic social services, as well as social support networks and participation.

The RDA model sought to test its analytical framework (see figure in Case Study 2) by analyzing the 18 components shown in the analytical framework in order to identify which were critical to mitigate the effects of shocks on peoples' food security and well being. These 18 components had been identified via a qualitative process of expert and community consultation. The RDA undertaken in South Central Somalia found the most important determinants of resilience to be: having a pastoral livelihood; women's participation in household decision making; and diversity of income (particularly independent) sources. Additional important factors include: social networks; institutional functioning (quality of local governance); and basic services - particularly water, markets, phone coverage and vet services.

It is interesting to note how the significant resilience determinants identified by each study varied. The value of assets, particularly as part of a pastoral livelihood (i.e. livestock) is a common dimension, as is the importance of markets. The economic role of women (and youth) emerges in both Somalia studies, but not in the CoBRA work. There is perhaps an implicit overlap though, with the characteristics around alternative / non-farm incomes and wage labour highly rated in all CoBRA assessments as such income sources are often provided by the women and youth in a household.

By comparison it is interesting that peace and security was raised by the CoBRA model (where no assessments were done in Somalia) but was absent from the two Somalia studies[10]. This may reflect the fact that peace and security is more of a community than a household variable, and may not emerge from household level data collection. Similarly education levels, access to basic services and a number of income sources emerge as very important in CoBRA and in the Mixed Methods approach in Somalia, but were seen to have limited importance in the RDA approach.

5. Other results

In addition to the priority characteristics of resilience outlined above, the CoBRA model asked communities to score their attainment of the resilience characteristics on a scale of 0-10. Scores can be aggregated to a general score for each location or group. These findings also highlight the interventions communities (and resilient households) consider as best building resilience. The assessments show a strong relationship between the prioritised characteristics and the most highly rated interventions.

Comparisons between resilience in different livelihood zones, and between different wealth groups and genders within these, also yielded interesting findings in the mixed methods approach. For example better access to water and sanitation drastically distinguished more resilient urban households from less resilient ones, whilst access to education made a huge difference in resilience among pastoralists. Equally interesting was the comparison between male and female headed households: Female headed households have on average more resilience than male headed ones – perhaps attributed to their higher mobility, broader livelihood diversity, participation in collectives and networks, and the behavioural motivation they expressed so forcefully in qualitative consultations.

6. Comparing findings

All the models highlighted here are still in early or pilot stages of development. Most have only one round of data collected/ analysed for any target area. This means it is hard to assess precisely what longitudinal data will tell us about resilience for each. The extent to which the models can be used to compare findings between groups or locations also varies. The resilience scores provided by the CoBRA model cannot be compared between locations as they are derived from separate conversations in different contexts and therefore do not relate to each other in any systematic way. This is illustrated by the equally low attainment scores for Kajiado and Marsabit, despite Kajiado being seen as much more resilient to drought than Marsabit by most other resilience metrics. The Mixed Methods and Resilience Determinants Analysis models allow for better comparison of scores between locations (and probably over time), so long as the data set for each target is similar. However, ensuring similar, adequate data is available in

[10] It did come out strongly in a previous Mercy Corps study in Ethiopia that looked specifically at the links between conflict / insecurity and resilience: http://www.mercycorps.org/research-resources/coping-drought-ethiopia-building-peace-0

all locations for the purposes of a comparison could be a challenge in terms of the time and expense in collecting it, particularly from among mobile populations.

7. Gaps in resilience measurement

As mentioned, the focus of all the models to date seems to be the identification of the key factors or variables that make households (and in CoBRA - communities) more resilient. The logic being that once identified these areas or factors would form the focus for prioritizing investment and interventions. At this point none of the models attempt to describe in practical terms what level (or threshold) of attainment of the key factors a household would have to have attained in order to be considered 'resilient'. Consequently there is no way to quantify the specific number / or proportion of households in a target group/location that have achieved an acceptable level of resilience. Ultimately policy makers will need to understand when households have passed some 'resilience threshold' and track trends in the proportion of a population that can be assessed as above this threshold to monitor progress and impact. This will clearly require additional work and the development of resilience measurement models.

The way forward in measuring resilience

It is clear that many of the challenges related to measuring resilience stem, in part, from the overuse and multiple interpretations of the term. Resilience measurement frameworks can support an improved understanding of the term by setting out key variables and parameters that in effect define what resilience should look like once achieved. A key value of the three practical attempts to measure resilience is what they say about the important factors or variables that determine resilience. Developing clarity around the metrics that define resilience is therefore essential in informing improved programming and policies.

All agencies recognise resilience is highly multi-dimensional: It can also only be achieved by the co-ordinated efforts of a wide range of stakeholders at multiple levels. In the same way efforts to measure resilience should also be part of a co-ordinated and multi-sectoral approach. Developing multiple parallel approaches is not particularly helpful. At a national level, ***Governments should take the lead*** in developing consensual definitions and monitoring framework for resilience. Both the definition and the framework should be practical and may not please everyone. The Government agency or department designated with this task must be capable of true cross-sectoral co-ordination and inclusive holistic thinking to avoid the natural bias that may occur in definitions, measurement tools and ultimately interventions.

At the same time it is necessary to be clear in the definition of ***resilience as an end impact or outcome*** so that practical measurement frameworks can emerge. The identified impacts and outcomes may not meet every conceivable aspect of resilience but must be acceptable by the majority of stakeholders. The development of specific, universal and more locally contextual indicators can be delegated to appropriate specialist agencies - such as those whose work is highlighted here. The resilience measurement models highlighted here have all done this in their respective attempts to take resilience from theory into reality. They have all refined the potentially infinite number of variables that could be measured into more manageable shortlists. Often this has necessitated developing a more focused definition of resilience such as the achievement of an organisational goal e.g. food security. Unfortunately using three different approaches to measure resilience for the same target population may not be the most effective or efficient approach. National Governments have to agree on a single approach or at least how certain tools can feed into or enhance national frameworks.

Individual organisations such as ***NGOs (or even individual ministries) must recognise that they cannot build nor should they measure resilience alone***. The best efforts of even the biggest NGOs can only at most ***contribute*** to the achievement resilience. Consequently in understanding resilience as a bigger issue, through being involved in wider or higher-level resilience monitoring, they can start to recognise the potential extent of that contribution. This in turn may enable them to critically examine the value of their more sectorally specific work. Often an agency's work may be beneficial in and of itself, but it may actually be doing very little to build resilience. For example the construction of water points could be considered a key activity in building resilience; but in Marsabit, for example,

the CoBRA multi-sectoral stakeholder assessment identified peace and security as the priority characteristic of resilience. In such a case it may be that the creation of water point actually results in conflict and insecurity thereby undermining resilience. Agency level monitoring of standard water and sanitation metrics may not identify this.

Consequently **Governments must take the lead** in establishing national (and sub-national) frameworks that their own line ministries and other actors should use to assess the actual and potential contribution of their work. Impact level resilience indicators are likely to be meta / human development type indicators - such as increased incomes; peace and security; reduced malnutrition etc. As a condition of funding all 'resilience-building' interventions should demonstrate to donors and government authorities precisely how their actions will contribute in achieving these changes. Such a "joined up" approach to monitoring would ensure effort and investment is focused in the areas of greatest weakness or vulnerability.

The challenge will be to consider how the tools highlighted here, which yield very useful information, can be modified or incorporated into **national (or regional) frameworks**. In particular the tools could be useful in identifying the contextually specific dimensions or drivers of resilience for particular groups or communities. These can be used to inform standard data collection processes e.g. line ministry information systems, early warning data collection, national census or household budget support. They can also be used to get richer, qualitative information that helps to explain and understand quantitative data sets. Ideally they can also be used by communities in holding service providers and implementers to account for the quality and level of interventions they receive.

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This brief and other DLCI documents can be accessed at http://www.disasterriskreduction.net/east-central-africa/reglap

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